Claims

[c1] 1. A method for modeling electric arc behavior, said method comprising the steps of:

determining electrical conductivity distribution in an arc;

determining a current density distribution of the arc based on the determined electrical conductivity.

[c2] 2. A method according to Claim 1 wherein electrical conductivity distribution in the arc is determined using temperature and pressure distribution with an arc chamber.

[c3] 3. A method according to Claim 1 wherein determining current density distribution comprises the step of determining electrical potential of the arc.

[c4] 4. A method according to Claim 1 further comprising the steps of:

determining magnetic fields and Joule heating using the determined current density distribution; and

determining magnetic forces from the determined magnetic fields.

[c5] 5. A method according to Claim 4 further comprising the step of determining gas dynamics field using the determined Joule heating and magnetic forces.

[c6] 6. A system for modeling electric arc behavior, said system comprising:

a server computer;

a first client computer coupled to said server computer, said first client computer programmed to determine electrical conductivity distribution in an arc; and

a second client computer coupled to said server computer, said second client computer programmed to determine a current density distribution of the arc based on the determined electrical conductivity distribution.

[c7] 7. A system according to Claim 5 wherein said first client computer is programmed to determine electrical conductivity distribution in the arc using temperature and pressure distribution with an arc chamber.

[c8]   8. A system according to Claim 5 wherein said second client computer is programmed to determine electrical potential of the arc.

[c9]   9. A system according to Claim 5 wherein said second client computer is further programmed to determine magnetic fields and Joule heating using the determined current density distribution, and magnetic forces from the determined magnetic fields.

[c10]   10. A system according to Claim 9 wherein said second client computer is further programmed to determine gas dynamics field using the determined Joule heating and magnetic forces.